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and receiver encased in a stock, a moveable bolt assembly positioned within the receiver, the bolt assembly being adapted to convey a round of ammunition from the receiver into the chamber of the barrel, the bolt assembly comprising a bolt body, a bolt handle capable of moving the bolt assembly among open, closed, and closed and locked positions, and an electrically conductive firing pin, a trigger assembly operatively connected to the bolt assembly, a voltage supply means, and a safety mechanism having at least a "safe" and "fire" position, the improvement comprising:

Column 2, Lines 29-31:

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The instant invention further provides a process for firing electrically activated ammunition from [the] an electronic firearm, such as the example of an electronic firearm described above, comprising:

Column 2, Lines 66-67:

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[Fig. 1 is a] Figs. 1 and 1A are side elevational [view] views of the invention.

Column 3, Lines 1-9:

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[Fig. 2 is a] Figs. 2 and 2A are left rear elevational [view] views of a firearm of the present invention.

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[Fig. 3 is a] Figs. 3 and 3A are wiring [diagram] diagrams of one embodiment of a firearm of the invention.

[Fig. 4 is a] Figs. 4 and 4A are cross sectional [view] views in elevation showing one embodiment of a bolt assembly and trigger assembly of a firearm of the present invention with the firing pin in its rearwardmost position.

Column 3, Lines 17-18:

[Fig. 8 is a] Figs. 8 and 8A are cross sectional [view] views in elevation showing the bolt assembly of [Fig. 4] Figs. 4 and 4A with the firing pin biased forward.

Column 3, Lines 21-24:

[Fig. 10 is a] Figs. 10 and 10A are fragmental top plan [view] views of a firearm of the present invention with the barrel assembly removed.

[Fig. 11 is a] Figs. 11 and 11A are fragmental exploded [view] views of a firearm of the present invention.

Column 3, Lines 31-36:

The description below pertains to one embodiment of an operational sequence that can be utilized by a system control means of a firearm of the present invention. [Variations] The present invention can be used with a variety of different types of firearms, and variations and modifications of this operational sequence can be substituted without departing from the principles of the invention, as will be evident to those skilled in the art.

Column 7, Lines 1-6:

FIGS. 1 through 11 show various aspects of possible example embodiments of a firearm of the present invention that can be adapted to utilize the operational sequence described above. [Variations] The present invention can be adapted for use with a variety of different types of firearms and variations and modifications of these embodiments can be substituted without departing from the principles of the invention, as will be evident to those skilled in the art.

Column 7, Lines 7-21:

In FIGS. 1 through 11, an example embodiment of the present invention is illustrated, in which the firearm has a barrel 10 that is attached to receiver 11, and a stock 12. The stock consists of a forearm 12A at a forward portion thereof, a pistol grip 12B at a middle portion, and a butt 12C at a rearward portion thereof. Both the barrel and receiver are encased in the forearm 12A of the stock 12. The barrel has a chamber formed in its rear end where it is attached to the receiver. The chamber is connected and adapted to receive ammunition from the receiver. A bolt assembly, generally indicated as 20, is movably positioned within the receiver, behind and substantially aligned with the barrel, and has a handle 21. The barrel 10, receiver 11, bolt assembly 20, and trigger assembly 40 comprise the barrel assembly of the firearm. A safety switch [14,] 13 (FIGS. 1A, 2A, 3A, 10A and 11A) is shown behind the bolt assembly, which is shown in FIGS. 1, 1A and 2, 2A in a closed and locked position.

Column 7, Line 54 – Column 8, Line 2:

The system control means shown comprises voltage increasing means 5, an electronic switching means 5A (Fig. 3A), and means for detecting the presence of a round of ammunition 6 within the chamber. The embodiment of the voltage increasing means shown comprises a boost converter to increase the voltage from the battery to the level necessary to initiate the ammunition, for example, from 9 volts, if a battery of that voltage is used as the power source, to a voltage sufficient to initiate the electrically primed ammunition. The voltage increasing means typically comprises inductors, diodes, capacitors and switches, the arrangement of which is dependent on the specific boost converter used. Other embodiments may use converters other than the boost topology. Variations and modifications of these embodiments can be substituted without departing from those principles of the invention, as will be evident to those skilled in the art.

Column 9, Lines 23 – 32:

In addition, the firing pin plug and the firing pin are adapted to be adjustably connected, such as by the engagement of threads 28A (Figs. 4A and 8A) about the firing pin plug 28, with a corresponding thread 28B formed on the rearward area of the firing pin 29, thus permitting individual adjustment of the firing pin in relation to the firing pin plug so that the forward tip of the firing pin is adjustable with respect to the bolt face when the firing pin is biased into its rearwardmost position, thus supporting the primer cap in the ammunition during firing and preventing the firing pin from becoming lodged within the bolt body when it is forced rearward by the ignition of a round of ammunition within the chamber, as shown in [Fig. 4] Figs. 4 and 4A.

Column 11, Line 66 – Column 12, Line 5:

The electronically controlled and operated component parts of the firearm of the present invention[, including] include, for example, the bolt assembly, trigger assembly, voltage increasing means, electronic safety, status indicator, blind mate circuitry connections, system authorization switch, and electronic switching means for isolating the firing pin also provide desirable advantages.

Column 12, Lines 20 – 35:

The electronic switching means allows the system control to isolate the firing pin and safely discharge the voltage increasing means through a secondary path upon detection of a malfunction, such as by discharging the voltage in the voltage increasing means to ground as is known in the art. The electronic switching means also permits the system control to isolate the firing pin if the firearm has been inactive for a period of time, or other conditions specified, including the absence of a round of ammunition within the chamber of the barrel; the firearm's safety being in the safe position; the bolt being in the unlocked position; the bolt being in the open position; the turning off of the system authorization switch; the detection of a level of voltage from the voltage supply means falling below a predetermined level; the passing of a predetermined period of inactivity of the firearm; and the failure or malfunction of the system control means or any component connected thereto.

IN THE CLAIMS

Claims 1 – 9, 11 – 35 and 37 - 40 as originally filed and issued and new claims 41 – 43, 45 – 61, 64 – 69, 73 – 75, 85 – 87, and 89 – 90 are pending in this case.

✓ Please cancel original claims 10 and 36, and previously submitted new claims 44, 62, 63, 70
- 72, 76 - 84 and 88 without prejudice or disclaimer.

Pursuant to 37 C.F.R. § 1.121(b)(2), please amend the claims as follows:

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1. (Three Times Amended - Pending) In an electronic firearm for firing electrically activated ammunition, comprising a barrel [attached to a receiver], a chamber formed in the barrel [adjacent to the receiver, the receiver being] and adapted to receive at least one round of electrically fired ammunition, [the barrel and receiver encased in a stock, a moveable bolt assembly positioned within the receiver, the bolt assembly being adapted to convey a round of ammunition from the receiver into the chamber of the barrel, the bolt assembly comprising a bolt body, a bolt handle capable of moving the bolt assembly among open, closed, and closed and locked positions, and] an electrically conductive firing pin, a trigger assembly [operatively connected to the bolt assembly, and], a voltage supply means, and a safety mechanism [having at least a safe and fire position], the improvement comprising:

A. A system control means receiving power from the voltage supply means, programmed to control firing upon actuation of the trigger assembly, [safety, power conservation, and diagnostic functions,] the system control means comprising:

- i. Voltage increasing means connected to transmit increased voltage to the firing pin;
- ii. Switching means for isolating the firing pin from the voltage increasing means, and the voltage increasing means from the

voltage supply means, the switching means being activated upon the occurrence of at least one condition selected from:

- a. the absence of a round of ammunition within the chamber of the barrel;
- b. the safety mechanism being in [the] a safe position;
- [c. the bolt being in the unlocked position;]
- [d. the bolt being in the open position;]
- [e.] c. the passing of a predetermined period of inactivity of the firearm; and
- [f.] d. the failure or malfunction of the system control means or any component connected thereto;

[iii. Means for electronically detecting the presence of a round of ammunition within the chamber of the barrel;]

[iv. Means for monitoring the capacity of the voltage supply means; and]

[v.] iii. Electronic safety operatively connected to the safety mechanism for preventing voltage from reaching the firing pin when the safety mechanism is in the safe position and for preventing the system control means from detecting a trigger pull when the safety mechanism is in the safe position[;].

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- [B. Electronic trigger switch operatively connected to the trigger and the system control means, the electronic trigger switch adapted to send a signal to the system control means when the trigger is pulled;]
- [C. Electrical isolation means insulating the body of the firing pin, the firing pin having a forward conductive end and a rearward conductive area, the forward conductive end positioned to transmit voltage to a round of ammunition within the chamber of the barrel only when the bolt assembly is in a closed and locked position, the rearward conductive area positioned to receive voltage only when the bolt assembly is in the closed and locked position and;]
- [D. At least one indicator operatively connected to the system control means.]

2. (Amended - Pending). A firearm of claim 1 [wherein the] and further including a bolt assembly [has] having front and rear ends and which is movably positioned within [the] a receiver, positioned behind and substantially aligned with the barrel, the bolt assembly comprising a hollow bolt body operatively connected at its rear end to a hollow bolt plug, a bolt handle on the rear of the bolt assembly, a movable firing pin assembly within the bolt body having forward and rearward ends, and a firing pin spring to bias the firing pin assembly forward by acting between the bolt plug and the rear of the firing pin assembly.

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5. (Twice Amended – Pending). A firearm of claim 3 wherein the firing pin plug is a threaded firing pin adjustment screw adapted to fit into a threaded aperture in the rear end of

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the bolt plug, and the firing pin assembly comprises the firing pin adjustment screw at its rearward end, the screw operatively connected to a firing pin plunger, the firing pin plug [at a forward end of the firing pin assembly] operatively connected to the firing pin plunger, and a firing pin plunger insulator between the firing pin plunger and the firing pin [plunger] plug, the firing pin assembly being biased forward by the firing pin spring acting on the firing pin plunger and the rear of the bolt plug.

14. (Amended - Pending). A firearm of claim 1 [wherein the] and further comprising means for electronically detecting the presence of a round of ammunition within the chamber of the barrel [comprises], including at least [two electrodes] one electrode positioned to contact electrically conductive portions of a round of ammunition within the chamber.

15. (Amended – Pending). A firearm of claim 14 wherein said at least one electrode [is] comprises the firing pin.

19. (Amended - Pending). A firearm of claim 1 [wherein the] and further including an electrical isolation means [comprises] comprising a modification of [the] a surface of the firing pin.

20. (Amended – Pending). A firearm of claim [16] 19 wherein the surface modification comprises ion implantation.

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21. (Amended - Pending). A firearm of claim [1] 19 wherein the electrical isolation means comprises an insulating coating.

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25. (Amended - Pending). A firearm of claim 1 [wherein the] and further including an electrical isolation means [comprises] comprising an insulating sleeve surrounding the firing pin.

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30. (Twice Amended - Pending). A firearm of claim 1 and wherein the system control means and electronic safety are adapted to isolate the firing pin when the safety mechanism is in the safe position by rejecting signals received from the trigger [switch] assembly (a) when the trigger assembly is [pulled] activated, and (b) when the trigger assembly is [pulled] activated and held while the safety mechanism is switched from the safe position to [the] a fire position.

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31. (Amended – Pending). A firearm of claim 1 wherein the system control means is adapted to cause energy stored in the voltage increasing means to be diverted [to a secondary discharge path] upon isolation of the firing pin.

10/4 Sub 92
38. (Four Times Amended - Pending). In a process for firing electrically activated ammunition from an electronic firearm comprising a barrel [attached to a receiver], a chamber formed in the barrel [adjacent to the receiver, the receiver being] and adapted to receive at least one round of electrically fired ammunition, [the barrel and receiver encased in a stock, a

moveable bolt assembly positioned within the receiver, the bolt assembly being adapted to convey a round of ammunition from the receiver into the chamber of the barrel, the bolt assembly comprising a bolt body, a bolt handle capable of moving the bolt assembly among open, closed, and closed and locked positions, and], an electrically conductive firing pin, a trigger assembly [operatively connected to the bolt assembly], a voltage supply means for supplying a voltage to the firing pin, and a safety [having at least a safe and a fire position], the improvement comprising:

- A. Controlling and coordinating [all firing, safety, power conservation, and diagnostic functions, and regulating] the distribution of power to the firing pin through a system control by;
 - i. [Increasing the voltage from the voltage supply means, and] [regulating] Regulating the transmission of [the increased] voltage to the firing pin;
 - ii. Conserving power by isolating the firing pin from [the voltage increasing means, and the voltage increasing means from] the voltage supply means, upon the occurrence of at least one condition selected from:
 - a. the absence of a round of ammunition within the chamber of the barrel;
 - b. the safety being in [the] a safe position;
 - [c. the bolt being in the unlocked position;]
 - [d. the bolt being in the open position;]

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- [e.] c. the passing of a predetermined period of inactivity of the firearm;
- d. a system authorization switch being in an off position;
- [f.] e. the failure or malfunction of the system control means or any component connected thereto; and
- [iii. Electronically detecting the presence of ammunition within the chamber of the barrel;]
- [iv. Monitoring the capacity of the voltage supply means; and]
- [v.] iii. Preventing voltage from reaching the firing pin when the safety is in the safe position and preventing the system control from accepting [the] a signal from the trigger [switch] assembly generated by [a trigger pull] actuation of the trigger assembly when the safety is in the safe position[;]
- [B. Sending a signal to the system control means when the trigger is pulled; and]
- [C. Indicating the status of the firearm].

39. (Amended - Pending). A process of claim 38, further comprising detecting the presence of a round of ammunition within the chamber, and determining whether a detected round of ammunition within the chamber is viable.

40. (Amended - Pending). A process of claim 38 further comprising [visually] indicating the status of the firearm.